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# ANANKASTIC CONDITIONALS AND SALIENT GOALS

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## Abstract

In this paper I evaluate two recent analyses of anankastic conditionals, the designated goal analysis by von Fintel and Iatridou (2004) and the modal base restriction account of Penka, Krasikowa and von Stechow (2004). I will show that both theories make the wrong predictions in scenarios with multiple non-conflicting goals. To solve the problem, I propose that ordering sources select salient goals from the context of utterance. For anankastic conditionals the ordering source selects the goal described in the *if*-clause. At the end of this paper I present some arguments against the recent analysis of anankastic conditionals as counterfactuals by von Stechow, Krasikowa and Penka (2004).

## 1 Introduction

Anankastic<sup>1</sup> propositions state that something is a *necessary condition* of something else. In natural language, anankastic propositions are often expressed in the form of a conditional (von Wright 1963, 9-10). In such conditionals, the complement of the modal in the consequent is a necessary condition for achieving the goal introduced in the antecedent. Examples of anankastic conditionals are given in (1). Sentence (1b) for instance, states that unless you first empty yourself, you do not learn anything.

- (1) a. If you want to be a star, you must dress like one.
- b. You must first empty yourself, if you are to learn anything.
- c. If we want to be on time, we have to leave now.

The main challenge for an analysis of anankastic conditionals is to give a compositional account of the meaning of such sentences. The problem is the contribution made by ‘want to’ or ‘be to’ in the antecedent. On the one hand, these expressions do not seem to play any role in the anankastic interpretation. Note that (1c) states that leaving now is a necessary condition for us to be on time, not for us to *want* to be on time. On the other hand, the occurrence of ‘want’ in (1c) is not redundant. If we omit ‘want’, the sentence does not have the necessary condition interpretation anymore:

- (2) If we are on time, we have to leave now.

The expression of intention in the antecedent is thus an essential ingredient of anankastic conditionals.

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<sup>1</sup>From the Greek ἀνάγκη which means ‘necessity’

Not every conditional of the form ‘if want  $p$ , then must  $q$ ’ states that something is a necessary condition for something else. The following pair by Hare (1971, 45) clearly shows this point:

- (3)    a.    If you want sugar in your soup, you should ask the waiter.  
           b.    If you want sugar in your soup, you should get tested for diabetes.

Whereas (3a) expresses that asking the waiter is a means of having sugar in your soup, (3b) does not mean that getting tested for diabetes is a means of having sugar in your soup. Rather it means something like ‘in view of your health, if you want sugar in your soup, you should get tested for diabetes’.

The paper is structured as follows. First I give some background on Kratzer’s framework for modals and conditionals. In section 3 I discuss the existing accounts of anankastic conditionals and in section 4 I present my own analysis. At the end of the paper I discuss the objections against my analysis put forward by von Stechow et al. (2004), and I compare my approach to their analysis of anankastic conditionals as counterfactuals.

## 2 Background: Kratzer’s Semantics

Most existing accounts of anankastic conditionals take Kratzer’s integrated theory of modals and conditionals (Kratzer 1981) as their point of departure. However, as it stands, Kratzer’s doubly relative semantics doesn’t offer a straightforward account of these sentences.

In Kratzer’s doubly relative semantics the interpretation of modals is dependent on two conversational backgrounds: the *modal base* and the *ordering source* (Kratzer 1981). The modal base and ordering source parameters are modelled as functions from worlds to sets of propositions. The modal base  $f$  assigns to the world of evaluation  $w$  a set of propositions  $f(w)$  that describes the domain of possible worlds that the modal quantifies over. The ordering source  $g$  provides a further restriction on the domain. It assigns a set of propositions to  $w$  that serves to order the modal base worlds with respect to how close they are to the ideals expressed by  $g(w)$ . The ordering induced by a set of propositions  $g(w)$  is defined the following way:

- (4)    Ordering Sources  
           for all worlds  $w'$  and  $w'' \in W$ :  
            $w' \leq_{g(w)} w''$  iff  $\{p : p \in g(w) \text{ and } w'' \in p\} \subseteq \{p : p \in g(w) \text{ and } w' \in p\}$

Thus a world  $w'$  is at least as close to the ideal  $g(w)$  as a world  $w''$  iff all the propositions of  $g(w)$  that are true in  $w''$  are also true in  $w'$ .

Modals quantify over those modal base worlds that are best by the ordering source.

### (5)    Kratzer’s Semantics for Modality<sup>2</sup>

- (i)    ‘must  $p$ ’ is true in  $w$  iff for all  $w' \in \bigcap f(w)$  such that  $\neg \exists w'' \leq_{g(w)} w'$  it holds

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<sup>2</sup>I give a simplified version of the definitions under the assumption that there always exist closest worlds (the so-called Limit Assumption, see Lewis (1973, 19-21). I’ll make this assumption throughout the paper.

- that  $p$  is true in  $w'$
- (ii) 'can  $p$ ' is true in  $w$  iff there is a  $w' \in \bigcap f(w)$  such that  $\neg \exists w'' \leq_{g(w)} w'$  and  $p$  is true in  $w'$

The modal base and ordering source of a given expression are determined in part by its lexical meaning and by its conversational background. Typically, the modal base is factual, containing facts, but the ordering source need not be realistic. In general, the ordering source contains ideals. Consider example (6c):

- (6) a. According to the school's tradition, the champions and their partners open the ball.  
 b. Harry is a champion.  
 c. Harry has to dance.

For 'has to' in (6c),  $f$  is circumstantial, picking out the relevant circumstances in  $w$ , that Harry is a champion, and  $g$  is deontic, containing the school's tradition. Sentence (6c) is true in  $w$  relative to  $f$  and  $g$  iff in all worlds  $w'$  in which Harry is a champion and that correspond most to the tradition, Harry dances in  $w'$ .

With respect to conditionals, Kratzer assumes that *if*-clauses restrict the modal base of the (possibly covert) modal in the consequent. The material in the *if*-clause is thus treated as a hypothetical fact.

- (7) Kratzer's Semantics for Conditionals
- (i) 'if  $p$ , then must  $q$ ' is true in  $w$ , iff  
 for all  $w' \in \bigcap f^+(w)$  such that  $\neg \exists w'' \leq_{g(w)} w'$ ,  $q$  is true in  $w'$   
 and  $f^+(w) = f(w) \cup \{p\}$
- (ii) 'if  $p$ , then can  $q$ ' is true in  $w$ , iff  
 there is a  $w' \in \bigcap f^+(w)$  such that  $\neg \exists w'' \leq_{g(w)} w'$  and  $q$  is true in  $w'$   
 and  $f^+(w) = f(w) \cup \{p\}$

To see how this works, consider sentence (8). The *if*-clause restricts the modal base of 'has to' in the consequent to worlds in which Harry's scar hurts again. The conditional is then true in  $w$  iff Harry goes straight to Dumbledore in all those worlds  $w'$  such that Harry's scar hurts again and that correspond most to his godfather's command.

- (8) If Harry's scar hurts again, he has to go straight to Dumbledore (as commanded by his godfather).

As said above, the Kratzerian analysis fails for anankastic conditionals. To see why, consider the following scenario. In the actual world, you want to become an actor. You do not want to hunt tigers. But I do not know that. To become an actor, you must go to Hollywood. To hunt tigers, you have to go to the jungle. In this scenario, it seems that I can felicitously utter (9) and that my utterance is true.

- (9) If you want to hunt tigers, you must go to the jungle.

But Kratzer predicts that it is false, because the ordering source  $g(w)$  selects what you

want in the actual world. That is, (9) is true in  $w$  iff you go to the jungle in all those worlds  $w'$  such that you want to hunt tigers in  $w'$  and as much as possible of what you want in the actual world, i.e. to be an actor, is true in  $w'$ . Clearly, (9) comes out false, because in the worlds that are best by  $g(w)$ , you will go to Hollywood. You will not go to the jungle in all of those worlds.

### 3 Previous Analyses

#### 3.1 Sæbø's Analysis

The first attempt to mend Kratzer's framework in order to account for anankastic conditionals was made by Sæbø (2001).<sup>3</sup> He takes over Kratzer's insight that *if*-clauses are devices for restricting the domain of the modal operator in the consequent. However, whereas Kratzer maintains that *if*-clauses always restrict the *modal base*, Sæbø proposes that in sentences such as (10) the *if*-clause adds a proposition to the *ordering source*. He thus treats the *if*-clause as a hypothetical ideal, instead of a hypothetical fact.

(10) If you want to go to Harlem, you must take the A train.

For (10) the initial modal base is circumstantial, specifying all the relevant circumstances about the railroads, geography etc. The ordering source is teleological, containing your goals. To this ordering source, the proposition that you go to Harlem is added. This is, in Sæbø's terminology, the internal antecedent of the conditional, i.e. the complement of 'want'. Note that the external antecedent, i.e. the proposition that you *want* to go to Harlem is not added to the ordering source, since this would have the effect that you want what you want. Sæbø interprets 'want' only as a signal as to which kind of modality is invoked by the modal in the consequent. Sæbø assigns the following truth conditions to (10):

(11) (10) is true in  $w$  iff in all  $w' \in \bigcap f(w)$  such that  $\neg \exists w'' \leq_{g^+(w)} w'$ , you take the A train in  $w'$ , and  $g^+(w) = g(w) \cup \{\text{you go to Harlem}\}$

It follows from this analysis that *if*-clauses may fulfill either one of two possible roles. In ordinary conditionals, such as Hare's diabetes-example (3b), the *if*-clause restricts the modal base, but in anankastic conditionals such as Hare's waiter-sentence (3a), the internal antecedent restricts the ordering source. Thus Sæbø's theory of conditionals is as follows:

(12) Sæbø's Analysis of Conditionals<sup>4</sup>

'if  $\phi$ , then modal  $\psi$ ' is interpreted relative to:

- (i)  $f^+(w)$  and  $g(w)$ , where  $f^+(w) = f(w) \cup \{\phi\}$ , **or**
- (ii)  $f(w)$  and  $g^+(w)$ , where  $g^+(w) = g(w) \cup G_\phi$ , where  $G_\phi$  is the ordering source expressed in  $\phi$

<sup>3</sup>(Sæbø 2001) draws on a much earlier manuscript (Sæbø 1986).

<sup>4</sup>The rule I give is a simplification which, in my opinion, captures the essence of Sæbø's theory of conditionals.

We can now give an explanation of why ‘want to’ or ‘be to’ has to be present in the antecedent of a conditional for it to express the anankastic meaning. Propositions that do not contain any expression of intention do not express an ordering source. Consequently, such antecedents cannot restrict the ordering source. The *if*-clause of sentences as (2) can only restrict the modal base.

The main problem with Sæbø’s analysis is that it makes the wrong predictions. Independently of one another, both von Fintel and Iatridou (2004) and Penka et al. (2004) have argued that his account runs into problems in scenarios in which you have inconsistent goals. Von Fintel & Iatridou (2004) have come up with the Hoboken scenario. Suppose that in  $w$  you want to go to Hoboken. But I do not know that. The only way to Hoboken is the PATH train. The only way to Harlem is the A train. I say correctly:

(13) If you want to go to Harlem, you must take the A train.

Under Sæbø’s analysis of (13), your goal of going to Harlem is added to the initial ordering source, which contains what you want in the actual world: going to Hoboken. Sentence (13) is true iff in all modal base worlds  $w'$  that correspond most to what you want, you take the A train in  $w'$ . The problem is that going to Harlem and going to Hoboken are inconsistent goals, so that you can only realize one of your goals. It follows that modal base worlds in which you go to Hoboken are just as ideal as modal base worlds in which you go to Harlem. Consequently, it won’t be true that you take the A train in all those ideal worlds, since in some of them, you’ll take the PATH train. Thus, under Sæbø’s analysis, (13) is predicted to be false in the Hoboken scenario.

Penka et al. (2004) on the other hand, argued that Sæbø can’t handle the so called mayor scenario.<sup>5</sup> I want to become the mayor in  $w$ , but I don’t want to go to the pub regularly in  $w$ . And in  $w$  one becomes the mayor only if one goes to the pub regularly. Thus  $g(w)$  contains two propositions: that I become the mayor, that I do not go to the pub, and the modal base contains the fact that I cannot achieve both these goals at the same time. The following conditional is true in this scenario:

(14) If you want to become the mayor, you must go to the pub regularly.

Under Sæbø’s analysis however, (14) is false. According to his analysis, (14) is true in  $w$  relative to  $f(w)$  and  $g^+(w)$ , where  $g^+(w) = g(w) \cup \{\text{you become the mayor}\}$ , iff in all modal base worlds  $w'$  that are ideal according to  $g^+(w)$  you go to the pub regularly. But according to  $g^+(w)$  worlds in which I become mayor (and go to the pub) are just as ideal as the worlds in which I do not go to the pub. Thus (14) is false.

### 3.2 Von Fintel & Iatridou’s Analysis

Von Fintel & Iatridou (2004) discuss three possible analyses for anankastic conditionals. In the end, they decide to go with the so-called designated goal analysis. This analysis postulates that in anankastic conditionals the hypothetical goal overrides any conflicting goals that you actually have (von Fintel and Iatridou 2004, 5). The goal expressed in the *if*-clause then functions as the *designated goal*: the only relevant goal in evaluating the

<sup>5</sup>Note that this scenario resembles the example of “practical inference” discussed by Kratzer (1981, 65).

conditional. The main idea is that the ordering source that is obtained by intersecting the hypothetical goal  $p$  with the initial ordering source  $g(w)$  is further revised to make it consistent. Von Fintel & Iatridou (2004) do not provide a definition of this revised  $g^+(w)$ . They probably have in mind that an anankastic conditional ‘if want  $p$ , then must  $q$ ’ is interpreted relative to a circumstantial  $f$  and a teleological  $g^+$ , where  $g^+(w)$  is the set of all maximally consistent subsets of  $g(w) \cup \{p\}$ .

The analysis of von Fintel & Iatridou makes the right predictions in the Hoboken scenario, where you have two inconsistent goals, going to Hoboken and going to Harlem. Sentence (13) comes out true, since we do not take your goal of going to Hoboken into consideration. The modal base worlds are only ranked with respect to your ideal of going to Harlem which is the designated goal. The ideal modal base worlds are thus worlds in which you go to Harlem. In all those worlds you will take the A train. Therefore, (13) is true under the Hoboken scenario.

However, whereas von Fintel & Iatridou’s designated goal analysis works fine for scenarios with inconsistent goals, it fails in intuitively simpler scenarios: scenarios in which you have multiple non-conflicting goals. The following scenario is a case in point. There are two trains going to Harlem in  $w$ , the A train and the B train. At the station I ask about ways to get to Harlem, and the man behind the counter answers by uttering (15). His utterance is false, since taking the A train is not the only way to get to Harlem.

(15) If you want to go to Harlem, you must take the A train.

But now suppose that in the actual world, I have more goals than just going to Harlem. Suppose that I want to meet my idol, Ruud van Nistelrooy<sup>6</sup> and that Ruud happens to be on the A train. Intuitively, the utterance in (15) is still false. But von Fintel & Iatridou predict that it is true.

According to von Fintel & Iatridou (15) is interpreted relative to an ordering source  $g^+(w)$  that contains both my goal of going to Harlem and my goal of meeting my idol. Since these two goals are not inconsistent, the hypothetical goal does not override my goal of meeting Ruud. The sentence is true iff I take the A train in all circumstantially accessible worlds  $w'$  in which I get most of what I want. According to  $g^+(w)$  the best worlds are those in which I get to go to Harlem *and* get to meet Ruud van Nistelrooy. And in those worlds I will take the A train. Hence, (15) comes out true.

The problem is that under von Fintel & Iatridou’s analysis the modal doesn’t quantify over all worlds in which I go to Harlem, but only over a subset thereof, i.e. worlds in which I go to Harlem and meet Ruud van Nistelrooy. Consequently, the anankastic reading is not obtained. Taking the A train is a necessary condition for going to Harlem if I take the A train in all worlds in which I go to Harlem. And so the modal has to quantify over all those worlds. But if the initial ordering source  $g(w)$  is non-empty, this doesn’t happen. In other words, the hypothetical goal does not only have to override any conflicting goals you actually have, but it has to override *all* other goals you actually have.

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<sup>6</sup>Ruud van Nistelrooy is the star of the Dutch soccer team.

### 3.3 Penka, Krasikowa and von Stechow's analysis

Penka et al. (2004) propose an alternative solution to the problem of which Sæbø's theory suffers, i.e. the problem of scenarios with inconsistent goals.<sup>7</sup> They claim that in case of anankastic conditionals the internal antecedent proposition restricts the *modal base* of the modal in the consequent.

(16)    Modal Base Restriction

An anankastic conditional 'if want  $p$ , then must  $q$ ' is interpreted relative to a circumstantial  $f^+$  and a teleological  $g$ , where  $f^+ = f(w) \cup \{p\}$

This solves the mayor problem in the following way. According to Penka et al. (14) is true iff you go to the pub regularly in all modal base worlds, i.e. worlds in which you become mayor, that are best by the ordering source. The ordering source contains the goals that you actually have: becoming mayor and not going to the pub regularly. These goals are inconsistent and thus you cannot achieve both. But since the ordering source orders the modal base worlds, and the modal base is already restricted to worlds in which you become mayor, there is no modal base world in which your goal of not going to the pub regularly is achieved, and so that goal doesn't play a role in deciding which modal base worlds are best.

As remarked by Penka et al. (2004), this modal base restriction analysis is essentially the same as von Fintel & Iatridou's designated goal approach. If you let the designated goal in the *if*-clause override any conflicting goals, you are actually treating it as a hypothetical fact. Remember that if the ordering source contains propositions that are inconsistent with the modal base, the latter has priority. A proposition is a necessity iff it is true in all worlds in which all of the modal base propositions are true, and as much of the ordering source propositions as possible. Von Fintel & Iatridou claim that the designated goal has the same sort of priority as the propositions in the modal base.

Since the analysis of Penka et al. is not different from the designated goal analysis, it is subject to the same problem. Penka et al. fail to predict that (15) is false in the Ruud van Nistelrooy scenario. Even if the modal base is restricted to worlds in which I go to Harlem, the worlds from the ordering source in which I meet Ruud van Nistelrooy are still accessible. The best worlds will still be worlds in which I go to Harlem and meet Ruud. In those worlds I'll take the A train, and so Penka et al. predict that (15) is true.

From this I conclude that the analysis of Penka et al. may do the job for which it was designed, that is, handling scenarios with conflicting goals. But it cannot handle what at face value seems to be a more simpler scenario: where you just have several goals that are not in conflict with one another.

## 4 An Alternative Analysis

### 4.1 Contextually Salient Goals

As said above, the Ruud van Nistelrooy scenario shows that in evaluating anankastic conditionals, the modal is not interpreted relative to an ordering source that contains *all*

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<sup>7</sup>Their analysis draws on (von Stechow 2004).



your goals, but rather relative to the goal that is described in the antecedent. Consider the scenario again. I want to meet Ruud van Nistelrooy in  $w$ . And in  $w$  there are two trains going to Harlem, the A train and the B train. Ruud van Nistelrooy happens to be on the A train. Sentence (17) is false according to this scenario.

(17) If I want to go to Harlem, I must take the A train.

The modal in the consequent is relative to a circumstantial modal base, and a teleological ordering source. If this ordering source only contains the proposition that I go to Harlem, (17) indeed comes out false. Following the truth conditions in (18), the conditional is true iff I take the A train in all circumstantially accessible worlds in which I achieve my goal, i.e. go to Harlem. But given that there are two trains going to Harlem, I will not take the A train in all those worlds.

(18) Anankastic Conditionals

‘if want  $p$ , then must  $q$ ’ is true in  $w$ , iff

for all  $w' \in \bigcap f(w)$  such that  $\neg \exists w'' \leq_{g+(w)} w'$ ,  $q$  is true in  $w'$

where  $g(w) = \{p\}$

Note that the analysis in (18) makes not only the right predictions for the Ruud van Nistelrooy scenario, but also handles scenarios in which you have conflicting goals, such as the Hoboken scenario or the mayor scenario. If we only take the hypothetical goal into consideration, it does not matter anymore that in the actual world you want something that conflicts with that goal. But what is the rationale behind this analysis? Can we make the claim that the ordering source is constituted by the internal antecedent plausible? We can under a reinterpretation of Kratzer’s doubly relative semantics.

There are two different views on ordering sources in the literature. First, Kratzer (1981) assumes that a teleological ordering source assigns to  $w$  all propositions that are your goals, *independent of the linguistic context*. Just as a juridical ordering source assigns *all* propositions that the law provides, and a deontic ordering source consists of *all* propositions that are considered to be good. This line of thinking is followed by von Stechow (2004) and Penka et al. (2004).

But there is another way of thinking about ordering sources, common in implementations of Kratzer’s framework in dynamic semantics. There it is assumed that the ordering source just is a contextually salient (set of) proposition(s). In Frank (1997) for instance, the ordering source parameter is treated as an anaphor that needs to link up to a context referent in the previous discourse. In the system of Geurts (1999) the antecedent of the anaphor would be a propositional referent.

The analysis of anankastic conditionals, and in particular the Ruud van Nistelrooy scenario, brings to light that these two ways of construing ordering sources are not equivalent. On the first view, a teleological ordering source assigns all your goals to  $w$ , whether it is known that these are your goals or not. It follows that in the Ruud van Nistelrooy scenario the wrong predictions are made for (17). But under the second view, the ordering source only contains those goals that have been explicitly introduced in the conversation. Because of that, we may assume that in the Ruud van Nistelrooy scenario, my goal of meeting my idol is not picked up by the ordering source parameter, and hence will not

influence the interpretation of the modal in (17).

The anankastic reading results from binding the ordering source parameter to the proposition in the antecedent that describes the goal. Introducing a goal in the antecedent of a conditional is a way of making that goal highly salient. It is therefore not surprising that the ordering source would link up to that goal. Support for this claim can be found in Bittner (2001) where it is argued that *if*-clauses are topical.

To sum up, I argue that it is misleading to think of ordering sources as functions that assigns sets of propositions to the world of evaluation. However, for the modal base parameter this line of thinking seems to be correct. For (17) for instance, the circumstantial modal base contains all the relevant facts, about the railroads, the geography, the train schedules, etc. But all these facts do not have to have been explicitly mentioned in the preceding discourse in order to end up in the modal base. We want them to be part of the modal base, whether we know all the departure schedules by heart or not.

That there are differences between modal bases and ordering sources has previously been noted by Frank (1997). She notes that presuppositions can only be accommodated in modal base contexts, not in ordering source contexts. For instance in (19c), the presupposition that Max owns a car should not be accommodated in the juridical context (19a), since this would mean that the law provides that Max owns a car, but in the factual modal base context (19b).

- (19) a. Any person who is not handicapped and owns a car, pays taxes for it.
- b. Max is not handicapped.
- c. Max must pay taxes for *his car*.

The analysis of anankastic conditionals shows that there is another difference between modal bases and ordering sources. Modal bases are functions that assign to the world of evaluation a set of propositions that describe everything that is known (in case of an epistemic modal base), or all the relevant facts (if the modal base is circumstantial). But ordering sources are contextually salient propositions.

## 4.2 An Objection

Von Stechow et al. (2004) have objected to an earlier version of this analysis that I put forward in Huitink (2004). Their main objection is that my analysis seems to ignore the very reason why Kratzer introduced the ordering source parameter in the first place. Initially, Kratzer (1977) assumed that modals are interpreted relative to just one conversational background, the modal base  $f(w)$ . This turned out to be problematic in case  $f(w)$  is inconsistent, since any proposition is a necessity relative to an inconsistent modal base, and no proposition is a possibility. To solve the problem, Kratzer (1981) proposed that modals are interpreted relative to two conversational backgrounds, the modal base and the ordering source. The modal base contains propositions that describe facts, and the ordering source describes ideals. It may be that the ordering source is inconsistent with the modal base. But if it is, the semantics is so designed that the modal base has priority over the ordering source. A proposition is a necessity if it is true in all the modal base worlds that correspond to the ideals *as much as possible*.

Now von Stechow et al. (2004, 8) object that in my analysis it is not possible that the ordering source contains something that conflicts the modal base. My answer to this objection is that such a conflict *is* possible in my system. My analysis does not contain a principle that keeps the ordering source from selecting a set of propositions that is inconsistent with the modal base. The mayor scenario of Penka et al. (2004) is a case in point. In this scenario it is given that you want to become mayor and that you do not want to go to the pub regularly. But unfortunately for you, the world is such that you can only become mayor if you do go to the pub regularly. I predict that for (20), the modal base contains the fact that you cannot realize both your goals, and the ordering source contains both the above mentioned goals. Consequently, (20) is false, since you do not go to the pub in all the worlds that are best according to this ordering source.

(20) You have to go to the pub regularly.

But I also predict that (21) is true, since there the ordering source parameter is bound to the goal described in the *if*-clause, under the assumption that a goal in an *if*-clause is highly salient:

(21) If you want to become mayor, you have to go to the pub regularly.

As far as I can see, this counters the main objection of von Stechow et al.

### 4.3 Relative Necessary Conditions

To conclude my analysis, I'd like to briefly remark on the way necessary condition is expressed in natural language. It seems that very often we express that something is a necessary condition of something else, *given certain assumptions*. Consider for instance Sæbø's paradigmatic example of an anankastic conditional again:

(22) If you want to go to Harlem, you must take the A train.

Strictly speaking, if (22) were a true anankastic conditional, it would have to be false, since there are always other ways of going to Harlem than taking the A train.<sup>8</sup> I could for instance go by car, or by foot, or take a taxi, or maybe fly a helicopter. It seems that in our understanding of (22) we already take it for granted that you go by train. As such (22) expresses a *relative* necessary condition.

The circumstances in view of which something is a necessary condition of something else, may also be explicitly stated:

- (23)
- a. If you want to go to Harlem, you have to take the A train, unless of course you get your car fixed in time.
  - b. If you want to go to Harlem, you have to take the A train, assuming that you don't own a car.

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<sup>8</sup>I owe this observation to Henriëtte de Swart (p.c.). Independently, von Stechow et al. (2004) have made the same observation.

In the semantics, relative necessary conditions can be accounted for by restricting the modal base further. For (22) the modal base contains all relevant facts with respect to the railroads, and the fact that you are going to travel by train. The ordering source is as before, your goal of going to Harlem. Then (22) expresses that in all circumstantially accessible worlds in which you travel by train and go to Harlem, you take the A train. Similarly, in (23a) the modal base is further restricted by the *unless*-clause, and in (23b) the restricting comes from the complement of *assuming*.

## 5 Anankastic Conditionals as Counterfactuals?

### 5.1 The Analysis

Recently, von Stechow et al. (2004) proposed a competing analysis that treats anankastic conditionals as counterfactuals. Whereas their analysis is at first sight very attractive, I think it ultimately fails.

Von Stechow et al. (2004) base their analysis on Sæbø's observation that that anankastic conditionals can be paraphrased by means of purpose constructions (Sæbø 2001). He presents the following pair of sentences:

- (24) a. If I want to be owner of North America, I must find the Golden Helmet.  
b. To be owner of North America, I must find the Golden Helmet.

Although the semantics of purpose constructions had not been widely studied, the theory developed by Bech (1957, 320ff.) clearly points in the direction of a Kratzerian account of modality, where the purpose clause determines the domain of quantification of the modal in the consequent.

The analysis of anankastic conditionals by von Stechow et al. (2004) consists of two parts. First, they take anankastic conditionals to be *elliptical*. That is, (25a) can be paraphrased as (25b), and its LF is something like (25c):

- (25) a. If you want to pass the exam, you should study well.  
b. If you want to pass the exam, you should study well, to do that.  
c. If you want to pass the exam, [you should [to pass the exam] study well]

According to von Stechow et al. the complex main clause alone expresses the anankastic reading. The domain over which the modal quantifies is thus restricted by the *to*-clause, and not by the *if*-clause. Von Stechow et al. claim that the *if*-clause in anankastic conditionals is not really 'conditional', just as the *if*-clause in (26) only seems to contribute a felicity condition:

- (26) If the train is leaving in 2 minutes, why are we standing around here talking?  
(von Stechow et al. 2004, 11)

This means that von Stechow et al. claim that anankastic conditionals are really sentences with the logical form: 'to  $\phi$ , must  $\psi$ '. This brings us to the second part of the analysis, which concerns the semantics of such sentences. Von Stechow et al. first try to treat conditionals as counterfactuals, in the sense of (Lewis 1973). That is, they propose that

(27) is true iff you study well in all the worlds  $w'$  such that you pass the exam in  $w'$  and  $w'$  is most similar to our world.

(27) To pass the exam, you should study well.

The truth conditions for anankastic conditionals then are as follows (von Stechow et al. 2004, 9):

(28) Anankastic Conditionals as Counterfactuals - First Version  
'To  $\phi$ , must  $\psi$ ' is true in  $w$  iff  
 $\text{Sim}_w(\phi) \subseteq \psi$

But, as von Stechow et al. (2004, 9-11) note, the above analysis has some unwanted consequences. First, since it claims that Lewis' would-counterfactuals have the same truth conditions as anankastic conditionals, it predicts that (29a) and (29b) have the same meaning. But this isn't borne out:

(29) a. If kangaroos had no tails, they would topple over.  
b. For kangaroos to have no tails, they would topple over.

The anankastic conditional in (29b) makes a stronger statement than (29a): it means that the only way to achieve that kangaroos have no tails is that they topple over, which is clearly false. The counterfactual in (29a) on the other hand is true.

To mend things, von Stechow et al. (2004, 9) suggest that we need a stricter relation between the antecedent and the consequent. They require that for anankastic conditionals the set of most similar worlds where the antecedent is true is a subset of the set of *most similar* worlds where the consequent holds:

(30) Anankastic Conditionals as Counterfactuals - Final Version  
'To  $\phi$ , must  $\psi$ ' is true in  $w$ , iff  
 $\text{Sim}_w(\phi) \subseteq \text{Sim}_w(\psi)$

This analysis accounts for the falsity of (29b). Probably none of the nearest worlds where kangaroos have no tails belongs to the nearest worlds where kangaroos topple over.

## 5.2 Why Anankastic Conditionals aren't Counterfactuals

I have three objections against the analysis of von Stechow et al. (2004). The first is that the restriction on the consequent in their final analysis is too strong. It predicts that (31) is false:

(31) If combustion is to occur, oxygen must be present.

Suppose that in the actual world oxygen is present, but that, for some other reason, combustion does not occur. Since oxygen being present is a necessary condition, but not a *sufficient* condition for combustion to occur, this is possible, and it might just be the case in the actual world. If it is, the set of worlds where oxygen is present that are most sim-

ilar to the actual world just is the singleton set containing only the actual world. Since combustion does not occur in the actual world, the nearest worlds where combustion occurs are not contained in the nearest worlds where oxygen is present. This is a general problem: whenever the internal antecedent is false in  $w$ , but the consequent is true, the analysis of von Stechow et al. predicts that the anankastic conditional is false, whereas such a conditional is intuitively true.

The second problem is that the analysis of von Stechow et al. (2004) cannot explain why the antecedent must contain an expression of intention in order for the conditional to express the anankastic meaning. There is nothing in their theory that excludes an LF for (32a) as in (32b). Hence, von Stechow et al. falsely predict that (32a) has an anankastic interpretation.

- (32)    a.    If you pass the exam, you should study well.  
           b.    If you pass the exam, [you should [to pass the exam] study well]

Note that my analysis more or less takes over Sæbø's explanation for the fact that (32a) has no anankastic interpretation. The *if*-clause in (32a) doesn't set up a deontic context referent, in the terminology of Frank (1997). It follows that the ordering source parameter cannot pick up material from the *if*-clause.

My final argument against the analysis of anankastic conditionals as counterfactuals is that under this analysis the teleological meaning aspect gets lost. If the modal in the consequent is not interpreted as teleological, how are we to derive that studying well is a *means* of passing the exam? Note that it will no do to allow that the modal is relative to two ordering sources, one based on overall similarity and one based on your goals. As argued in Frank (1997, 49) this would lead to a kind of proportion problem. So we really have to choose. Either the ordering source is teleological, or we order world in terms of their similarity to the actual world. I think there are better arguments for the first option than for the second. The fact that anankastic conditionals may be paraphrased in terms of purpose clauses shows that the modal in the consequent is sensitive to some goal. There is nothing that *prima facie* suggests that anankastic conditionals are counterfactuals.

## 6 Conclusion

I have discussed four analyses of anankastic conditionals. Three of these, Sæbø (2001), von Fintel and Iatridou (2004) and Penka et al. (2004), make the wrong predictions in the Ruud van Nistelrooy scenario. This problem can be solved by assuming that the ordering source selects a salient goal from the context of utterance, and that in the case of anankastic conditionals, this is the goal described in the antecedent. The fourth analysis by von Stechow et al. (2004) treats anankastic conditionals as counterfactuals. This avoids the Ruud van Nistelrooy problem. But as I have shown, this analysis runs into other problems. To me this indicates that anankastic conditionals just aren't counterfactuals.

Von Stechow et al. (2004) object to my analysis for conceptual reasons. I have argued that their objection isn't justified. As far as I can see, it is not problematic to reinterpret Kratzer's notion of ordering source. Ordering sources as anaphors is an idea that has been around for many years already. The analysis of anankastic conditionals shows that this really is a different view on ordering sources than Kratzer's original formulation. More

importantly, the analysis of anankastic conditionals requires such a notion of ordering source.

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